

## **ABSTRACT OF THE DISCLOSURE**

### **NANOTUBE CANTILEVER PROBES FOR NANOSCALE MAGNETIC MICROSCOPY**

The present invention provides an MFM or MRFM analytical device comprising a micro-dimensional probe that is capable of detecting single proton and single electron spin.

- 5 Furthermore, it provides an MFM or MRFM device comprising a micro-dimensional probe, that is capable of detecting magnetic structures of size of order one nanometer. In particular, the present invention provides a micro-dimensional probe for an MFM or MRFM device that comprises a CNT cantilever that comprises a nanoscale ferromagnetic material. The CNT cantilever can be attached to an electrode as a component of a microscopic probe which is
- 10 coupled with an electrical circuit as a component of a device for nanoscale MFM or MRFM micro-dimensional probes. The device comprising the probe and electrical circuit can be incorporated into an existing scanning probe microscope (SPM) apparatus having accommodation for electrical readout.